

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently Amended) A manufacturing method of an integrated capacitor, comprising:

forming a hole in a semiconductor substrate;

depositing a dielectric film on an inner face of the formed hole;

heat-treating the deposited dielectric film;

depositing a silicon film on the dielectric film;

embedding a resist film into [[in]] the hole except an upper portion of the inner face of the hole on which the dielectric film and the silicon film are deposited;

etching the silicon film on the heat-treated dielectric film with the embedded resist film as a mask;

removing the resist film;

removing the heat-treated dielectric film by etching with the silicon film remaining after the etching as a mask; and

embedding an electrode material into [[in]] the hole having the dielectric film remaining after the removal by etching.

2. (Original) A manufacturing method of an integrated capacitor as set forth in claim 1, wherein in the depositing the silicon film on the dielectric film, a polycrystalline silicon film or an amorphous silicon film is deposited as the silicon film.

3. (Original) A manufacturing method of an integrated capacitor as set forth in claim 1,
wherein

in the embedding the resist film in the hole except the upper portion of the inner
face of the hole on which the dielectric film and the silicon film are
deposited, a novolak resin is used as the resist film, and

in the removing the resist film, the resist film is removed using a mixed solution of
sulfuric acid and hydrogen peroxide aqueous solution.

4. (Original) A manufacturing method of an integrated capacitor as set forth in claim 1,
wherein in the depositing the dielectric film on the inner face of the formed hole,
an Al_2O_3 film is used as the dielectric film and deposited by an ALD method.

5. (Original) A manufacturing method of an integrated capacitor as set forth in claim 4,
wherein the heat-treating the deposited dielectric film is performed at a
temperature of 800°C or higher.

6. (Original) A manufacturing method of an integrated capacitor as set forth in claim 1,
wherein in the depositing the dielectric film on the inner face of the formed hole,
as the dielectric film, a stacked film of an Al_2O_3 film and a dielectric film other
than the Al_2O_3 film is deposited.

7. (Original) A manufacturing method of an integrated capacitor as set forth in claim 1,
wherein the removing the heat-treated dielectric film by etching with the silicon
film remaining after the etching as the mask, heated phosphoric acid is used as a
chemical for the removal by etching.

8. (Original) A manufacturing method of an integrated capacitor as set forth in claim 1,
wherein the silicon film remaining after the etching is left as a part of the
electrode material to be embedded in the hole.

9. (Currently Amended) A manufacturing method of an integrated capacitor,
comprising:

forming a hole in a semiconductor substrate;

depositing a dielectric film on an inner face of the formed hole;

depositing a silicon film on the deposited dielectric film;

embedding a resist film into [[in]] the hole except an upper portion of the inner face of the hole on which the dielectric film and the silicon film are deposited;

etching the silicon film on the deposited dielectric film with the embedded resist film as a mask;

removing the resist film, and removing the deposited dielectric film by etching with the silicon film remaining after the etching as a mask;

heat-treating the dielectric film remaining after the removal by etching; and

embedding an electrode material into [[in]] the hole having the dielectric film remaining after the removal by etching.

10. (Original) A manufacturing method of an integrated capacitor as set forth in claim 9, wherein in the depositing the silicon film on the deposited dielectric film, a polycrystalline silicon film or an amorphous silicon film is deposited as the silicon film.

11. (Original) A manufacturing method of an integrated capacitor as set forth in claim 9, wherein

in the embedding the resist film in the hole except the upper portion of the inner face of the hole on which the dielectric film and the silicon film are deposited, a novolak resin is used as the resist film, and

in the removing the resist film and removing the deposited dielectric film by etching with the silicon film remaining after the etching as the mask, the resist film is removed using a mixed solution of sulfuric acid and hydrogen

peroxide aqueous solution, and the deposited dielectric film is removed by etching with the silicon film remaining after the etching as the mask.

12. (Original) A manufacturing method of an integrated capacitor as set forth in claim 9, wherein in the depositing the dielectric film on the inner face of the formed hole, an Al_2O_3 film is used as the dielectric film and deposited by an ALD method.
13. (Original) A manufacturing method of an integrated capacitor as set forth in claim 12, wherein the heat-treating the dielectric film remaining after the removal by etching is performed at a temperature of 800°C or higher.
14. (Original) A manufacturing method of an integrated capacitor as set forth in claim 9, wherein in the depositing the dielectric film on the inner face of the formed hole, as the dielectric film, a stacked film of an Al_2O_3 film and a dielectric film other than the Al_2O_3 film is deposited.
15. (Original) A manufacturing method of an integrated capacitor as set forth in claim 14, wherein the dielectric film other than the Al_2O_3 film is a HfO_2 film.
16. (Original) A manufacturing method of an integrated capacitor as set forth in claim 9, wherein the silicon film remaining after the etching is left as a part of the electrode material to be embedded in the hole.
- 17.-20. (Canceled)